9.0 ALTERNATIVES AND MITIGATION

9.1 ALTERNATIVES TO THE PROPOSED PROJECT

The Settlement Agreement (Settlement) identifies alternatives to the Proposed Project that must be considered in this Environmental Assessment (EA). These alternatives are described in Chapter 3, "Description of Proposed Project and Alternatives." Briefly, these are as follows:

- The "No-Action Alternative";
- Re-routing alternatives; and
- Pollution prevention (or control) alternatives.

9.1.1 No-Action Alternative

The No-Action Alternative provides a basis for comparison with the Proposed Project and other action alternatives. In this EA, the Lead Agencies have examined all potential impacts that will result from the Proposed Project, not just the incremental impacts that represent a change from crude oil operation to refined product service.

9.1.1.1 Description and Basis for the No-Action Alternative

The Lead Agencies have determined that the No-Action Alternative is the resumption of crude oil transport through the former Exxon Pipeline Company (EPC) pipeline between Crane and Houston (J1). The Lead Agencies considered designating no operation of the pipeline as the No-Action Alternative. This option was eliminated from consideration because no further federal approval would be required for Longhorn to resume a crude oil operation between Crane and Houston. There is considerable evidence that a return to crude operation is feasible and the Lead Agencies believe it is unlikely that valuable pipeline infrastructure would be abandoned. At the conclusion of this process, if the Proposed Project were not implemented, Longhorn would be permitted to operate the Crane-to-Houston segment as a crude oil pipeline, as long as it refiled the previously-approved response plan. The No-Action Alternative does *not* include transport of crude oil between El Paso and Crane since there was no previous pipeline operation there.

The Lead Agencies' analysis of the No-Action Alternative included the following considerations:

- A new or modified response plan must be filed only if a "new or different operating condition . . . [that] would substantially affect the implementation of a response plan" is created. In this case, because no new or different operating condition would be created with the resumption of crude service, Longhorn would not be required to file a new response plan. See 49 CFR § 194.121(b).
- As stated above, Longhorn has no regulatory obligation to submit a modified response plan if it resumes crude oil service between Crane and Houston. At the time that EPC took the line out of service in 1995, there was an approved response plan in place. Generally, when one pipeline operator purchases an existing pipeline, the operator purchasing the pipeline need only refile (or take over) the existing response plan of the previous operator. This is a common practice in the pipeline industry. There is no requirement that the operator purchasing the line prepare and receive approval for a new response plan. In this case, Longhorn would merely be required to refile the plan prepared by EPC.
- Although the line was temporarily taken out of service, it was never abandoned or surplused. Under 49 CFR § 195.402(c)(10), any operator who abandons a pipeline must modify its operations and maintenance manual to indicate that the pipeline is being abandoned, and disconnect, purge, and seal the line. None of those actions was taken with this pipeline. As shown in Appendix 9A, Longhorn has made it clear that neither EPC nor Longhorn ever intended to abandon the pipeline. If the pipeline had been abandoned, Longhorn would be required to submit a new response plan.
- Under the No-Action Alternative, the product being transported would remain crude oil. If there was a change in the product being transported, a plan modification would be necessary. (49 CFR § 194.121(b)(3)).
- DOT regulations do not require plan modification when a change in ownership or change in the direction of product flow takes place.
- Although crude oil production in west Texas has declined, there is no clear indication that a crude oil operation is not a viable option. Longhorn has submitted substantial background information indicating that it is possible that a crude oil pipeline would be operated. In Appendix 9A, Longhorn states that crude oil service would resume if Longhorn was not allowed to proceed with the Proposed Project.
- Longhorn has indicated that if it returned the pipeline to crude oil service, it would likely transport crude from west Texas to the Houston area. In order to operate the entire 723-mile Longhorn Pipeline System (System) as a crude operation, Longhorn would be required to modify its response plan. The pipeline safety regulations, under 49 CFR § 194.121(b)(1), require the response plan to be modified if an existing pipeline is extended. Therefore, the No-Action Alternative contemplates crude service only between Crane and Houston. Following resumption of crude service between Crane and Houston, Longhorn would have at least two options regarding the newly-constructed portions of the line: It could either submit a modified response plan for approval, or use alternative means of transportation to transport crude oil between El Paso and

Crane. As noted in Appendix 9A, other options may exist, including the option of transporting crude from east to west, in which case transportation across the entire state may not be necessary.

9.1.1.2 Evaluation of the No-Action Alternative

This section compares environmental and safety aspects of the No-Action Alternative with the Proposed Project. If the Longhorn pipeline were to be converted back to crude oil pipeline, the approximately 450-mile Crane-to-Houston (J1) portion of the pipeline would be used to carry west Texas crude oil.

For purposes of evaluating the impacts of the Proposed Project under the National Environmental Policy Act (NEPA), the EA compares the Crane-to-Houston portion of the Proposed Project with mitigation measures to an unmitigated No-Action Alternative over this same 450-mile segment. For those segments of the System that are newly-constructed segments, the comparison will be against a baseline of no project.

9.1.1.2.1 Proposed Project versus No-Action Alternative: Comparative Probabilities of a Spill

The probability of leaks and spills on an unmitigated west-to-east Longhorn crude oil pipeline would be approximately equal to that of an unmitigated east-to-west gasoline pipeline because the risk factors are similar. The factors that would contribute to loss of containment are similar in both scenarios. There are some potential probability-of-failure differences between a crude oil and a refined products pipeline. These include changes to the pressure profile, surge potential, and internal corrosion potential. The pressure profile and surge potential would be affected by throughput. The recent historical record of the crude oil pipeline is less than the planned throughput on the products line. However, regardless of throughput, the internal corrosion potential on the crude oil pipeline would be greater because of the chemical constituents in crude oil.

The mitigation measures presented in Section 9.2 go beyond compliance with DOT requirements and common industry practices and further reduce probabilities of leaks and spills. If Longhorn were to resume crude oil shipments from west to east without a commitment or obligation to carry out some or all of these additional mitigation measures, the probability of leaks and spills along the unmitigated crude oil pipeline would exceed those of the mitigated Proposed Project. On the other hand, the Proposed Project does introduce risks from pipeline

failure along the newly constructed El Paso-to-Crane and J1-to-GATX portions where no crude oil transport previously occurred.

The net effect of this comparison in probability factors tends to favor the Proposed Project because the mitigation in Section 9.2 is primarily aimed at reducing probabilities of a spill. Under the No-Action Alternative, Longhorn would not be required to implement the mitigation measures.

9.1.1.2.2 Proposed Project versus No-Action Alternative: Comparative Consequences of a Spill

As discussed in Chapter 6, the risk of a spill or leak is the product of the probability and the consequence of a spill or leak. The differences in consequences of a spill, after it has occurred, between the Proposed Project and the No-Action Alternative are, in part, a function of the properties of crude oil versus a refined products spill. Gasoline is used to represent other refined products in this discussion because a gasoline spill would result in greater consequence than a diesel spill. As discussed in Chapter 7, these differences in properties between the two liquids are as follows:

- Gasoline may have higher impacts to drinking water for both ground water and surface water, because of the effects of benzene and methyl tertiary-butyl ether (MTBE), and because transport characteristics make it more likely to reach a drinking water source in the event of a release.
- Crude oil may have slightly higher impacts to long-term water quality in ground water, because the higher viscosity, sorbability, and specific gravity make a crude oil release more likely than gasoline to sink deeper into the ground water column, to resist natural dilution and transport through flushing, and to be less likely to volatilize. This difference in impact varies by aquifer type.
- Except in those potential cases involving ignition, crude oil may have greater long-term impacts to land use than gasoline. In the absence of an ignition, a large crude oil release would result in more severe long-term impacts to land use because of the slower movement rates and lower volume removal effects of volatilization.
- Gasoline is more likely to ignite than crude oil, and because of the rapid heat release and the wider area of spread from a comparable volume released, a gasoline fire would be expected to result in greater damage than a fire involving crude oil. If ignition occurs, gasoline will impact a larger radius and potentially cause more damage to land use.
- Through vaporization, gasoline quantities will be reduced much faster than crude oil, possibly requiring less surface water pollution remediation.

The net effect of these comparisons in the properties of the two liquids tends to favor the No-Action Alternative. However, several of the mitigation measures in Section 9.2 require Longhorn to detect a leak more rapidly and respond to a leak faster than would occur under the unmitigated No-Action Alternative. These consequence reduction measures tend to offset the differences in properties of crude vs. refined products.

9.1.1.2.3 Proposed Project versus No-Action Alternative: Comparative Quantities of Liquid Shipped

The comparison of consequences in Section 9.1.1.2.2 assumes an equal transport volume of both liquids. For any given spill site, the level of consequences of a large spill are usually greater than for a small spill. The market data provided by Longhorn projecting a growth from 72,000 barrels per day (bpd) of product shipped increasing to 225,000 bpd contrast with the historical trend of generally dwindling quantities of crude oil shipped over the last decade of EPC operations over the Crane-to-Houston EPC pipeline. This decrease in crude oil transport is from approximately 44 million barrels per year (120,000 bpd) in 1986 to approximately 27 million barrels per year (74,000 bpd) in 1995 as shown in Appendix 9A.

Thus, it appears that the likelihood that Longhorn could operate at 225,000 bpd in refined product service seems higher than the likelihood that Longhorn would operate a crude oil pipeline at this same level of capacity. Therefore, absent evidence to the contrary, it is logical to assume that the quantity of liquid spilled will be greater for the refined products pipeline compared to a crude oil pipeline because of the greater throughput. However, with mitigation measures set forth in Section 9.2 that reduce the time for leak detection and response (e.g., shut-down of the pumps and closing of valves), the differences between the Proposed Project with its assumed larger throughput and the No-Action Alternative tend to offset each other.

9.1.1.2.4 Proposed Project versus No-Action Alternative: Comparison of Modes of Gasoline Transport

If the No-Action Alternative were to be implemented, the increasing demand for refined products in the El Paso Gateway Market would be satisfied through some means other than the Longhorn pipeline. These means include one or more of the following:

- Expanded refining capacity in these markets;
- Construction and operation of new pipelines (perhaps connecting the Texas Gulf Coast with the El Paso area); and/or

- Alternative transportation modes connecting the refined product supply points and these markets.

Expanding refining capacity in these markets could result in environmental and health impacts that occur with constructing and operating large refineries. In particular, refinery operation in El Paso, Phoenix, Tucson, and Albuquerque would increase emissions of volatile organic compounds, oxides of nitrogen, particulate matter, and carbon monoxide in air sheds that already exceed or threaten to exceed federal and state air quality standards.

Constructing new pipelines to replace refined product supply that would have been provided by the System would pose impacts from construction that would not occur with the already constructed System. Impacts from new construction are addressed in Chapter 7 and in the discussion of the alternative routes in Section 9.1.2 in this chapter. Operation of the new pipelines would result in the same kinds of risks that the System poses except that location of the risks would be different. Whether these locations involve more or less environmental and population-related sensitivity would only be known when potential new routes are proposed and assessed.

Because any new pipeline would use modern welding technology and new pipe, the integrity of the new pipelines would be expected to be better than that of the approximately 450 miles of the older pipe on the System. This comparative advantage of a new pipeline over the older portion of the Longhorn pipeline could be offset by the mitigation measures in Section 9.2.

A third means of meeting the refined product demand in the absence of the System is transporting refined product from refining centers, such as the Texas and Louisiana Gulf Coast, to the El Paso Gateway Market. The most common non-pipeline mode of transporting refined product from refineries to demand centers is through large tanker trucks (approximately 8,500-gallon capacity). As described in Chapter 6, the risks of non-pipeline transport modes are higher than those of pipelines. In particular, the number of deaths from tanker truck fires and explosions is more than 80 times greater than the number of deaths from pipeline accidents based on an equivalent number of gallon-miles shipped. Although the probabilities of tanker truck spills are higher than for pipelines, the quantity of product released to the environment will always be limited to the 8,500-gallon size, while a worst-case spill from the Longhorn pipeline could exceed 200,000 gallons.

9.1.1.2.5 Proposed Project versus No-Action Alternative: Comparison of Need for Future New Pump Stations

The greater the number of pump stations, the greater the impacts of pump station construction on natural and cultural resources and the greater the opportunity for leaks from valves, flanges, pumps, tanks, and other equipment during operation of the pump stations.

The Proposed Project will require more pump station construction than would the No-Action Alternative. The EPC line used six pump stations to transport crude oil from Crane to Houston. Longhorn proposes to use as many as 19 stations to transport 225,000 bpd from Houston to El Paso.

There are several reasons for the difference in the number of pump stations for the Proposed Project as compared to the EPC pipeline. The first is that the quantity of crude oil shipped by EPC was less than the quantity of refined products that would be transported under the Proposed Project. Less throughput requires fewer pump stations.

The second reason is that the Proposed Project includes the newly constructed 237-mile Crane to El Paso segment. More length of pipe requires more pumping stations.

The third reason is that the west-to-east transport of crude oil results in a largely "down-hill" flow from approximately 4,000 ft above sea level to near sea level. An east-to-west pipeline results in a 4,000 ft climb. A pipeline moving liquid uphill requires more pump stations than one moving liquid downhill.

As discussed in Chapter 3, the Proposed Project would require eight future pump stations to be constructed for full buildout of the System. The exact sites of these stations are not known. Depending upon where the new pump stations are constructed, there may be impacts to biological and cultural resources. A supplemental EA would be prepared for each set of new stations associated with a proposed increase in System throughput. This will ensure that environmental impacts of new station construction are considered and addressed.

9.1.1.2.6 Summary of Comparison between Proposed Project and No-Action Alternative

The comparison between the Proposed Project and the No-Action Alternative is summarized below.

Advantages of the Mitigated Proposed Project over Unmitigated No-Action Alternative

- The Proposed Project would result in a lower failure probability over the Houston-to-Crane segment (i.e., the majority of the pipeline and its most sensitive areas).
- The Proposed Project would result in slightly reduced long-term soil and water contamination consequences for the Proposed Project over the Houston-to-Crane segment because crude oil is more persistent in the environment than gasoline.
- The Proposed Project could reduce the need for construction of new refineries to serve the El Paso Gateway Market (west Texas, northern Mexico, New Mexico, and Arizona). The construction and operation of the new or expanded refineries would result in air, water, and solid waste impacts.
- The Proposed Project could reduce the need for new pipeline construction and operation to serve the El Paso Gateway Market. New pipelines would pose greater construction impacts because the Proposed Project is 99 percent constructed, whereas new pipelines would need to be sited, the right-of-way (ROW) cleared. Operational impacts from a new pipeline could be equal, greater, or less than operational impacts of the Proposed Project, depending upon the degree of mitigation measures applied to any new pipeline and the sensitivity of the affected environment.
- If the demand for petroleum products in the market areas to be served by the Longhorn pipeline were to be met by non-pipeline transport, the risk of accidents and deaths would be higher for alternative modes of gasoline transport.

Advantages of the Unmitigated No-Action Alternative over Mitigated Proposed Project

- In all newly constructed pipeline segments (west Texas and the first nine miles in Houston), which are compared against a no-pipeline scenario, risks and impacts would be less under the No-Action Alternative. This is because historically these newly constructed segments did not exist.
- Considering the likelihood that the Proposed Project would probably transport larger quantities than would the No-Action Alternative, the consequences of a large spill would be less for the No-Action Alternative assuming equal leak detection, valve closure time, and response time. The mitigation measures in Section 9.2 would offset this difference because they include enhanced leak detection and response.
- The probability of a fire or explosion from crude oil shipments under the No-Action Alternative is less than would be the case for a gasoline under the Proposed Project because gasoline is more likely to be ignited than crude oil.
- Short-term impacts to surface and ground water would be less under the No-Action Alternative than they would be under the Proposed Project because gasoline, with MTBE and higher concentrations of benzene, poses a greater risk to drinking water quality and spreads more rapidly than an equal amount of crude oil.

9.1.2 Route Alternatives to the Proposed Project: The Aquifer Avoidance/Minimization Route Alternative

As noted in Section 1.2, the Lead Agencies do not have statutory authority to prescribe the location or routing of pipeline facilities. However, that does not preclude consideration of alternative routes as part of the NEPA process.

9.1.2.1 Description of the Aquifer Avoidance/Minimization Alternative

The Settlement requires that the EA evaluate a route that avoids the Edwards Aquifer, the Edwards-Trinity Aquifer, Colorado River Alluvium, Carrizo-Wilcox Aquifer, and Gulf Coast Aquifer. The discussion of aquifers crossed by the Longhorn pipeline in Chapter 4 shows that it is not possible to completely avoid several of these aquifers because they cross the state in wide, sweeping bands that parallel the Gulf of Mexico from northeast to southwest. It is possible to avoid some critical aquifers and minimize exposure to others via a route that was developed more than a decade ago as the "Northern Alternative" to a proposed extension to the All American Pipeline segment.

The All American Pipeline is a 1,247-mile, 30-inch diameter, crude oil pipeline that was constructed in the mid-1980s to carry California crude oils to McCamey, Texas (near Crane). Before construction began, All American Pipeline proposed an additional 486-mile extension that would have utilized a ROW parallel and 10 to 30 miles to the south of Longhorn's 458-mile Crane-to-Galena Park (GATX) segment. The final 486-mile segment of the All American Pipeline was subject to a federal lawsuit that also resulted in a Settlement requiring a Supplemental Environmental Impact Statement (SEIS) with the US Bureau of Land Management (BLM) as the Lead Agency. The BLM evaluated two alternative routes to the route that proposed by the project proponent. BLM selected the "Northern Alternative" as the preferred alternative (BLM, SEIS, 1987) in large part because it avoided impacts to sensitive aquifers.

In particular, the Northern Alternative would completely avoid the Edwards Aquifer Balcones Fault Zone (BFZ). The Northern Alternative was not constructed and operated. However, because of the similarities between the Longhorn pipeline route and the proposed route by All American Pipeline, and because both proposed projects involve similar issues, the Northern Alternative Route in the BLM SEIS was selected as the alternative to be considered in this EA to satisfy the objectives of the Settlement.

One major difference between the Longhorn Proposed Project and the All American Pipeline Proposed Project is that the Longhorn System is already built, while the All American

pipeline would have required completely new construction for any of the three routes that BLM could have selected.

9.1.2.2 Evaluation of the Aquifer Avoidance/Minimization (AA/M) Route Alternative

As shown in Figure 3-1, the AA/M Route Alternative would replace 313 miles of the 458 miles of the existing GATX-to-Crane segment of the System with a new pipeline that would avoid and reduce possible impacts to several aquifers. This alternative was not been examined in the same degree of detail as the Proposed Project because detailed construction plans and alignments have not been developed. Nevertheless, based on information that Longhorn has provided and on analyses drawn from the 1987 All American SEIS, a comparative analysis of this alternative is provided below.

The description of the AA/M Route and the description of the existing environment along the route are included in Appendix 9B. The description draws upon and summarizes portions of the All American Pipeline SEIS.

9.1.2.2.1 Evaluation of the AA/M Route: Impacts of Construction

The 1987 All American SEIS was reviewed to identify the impacts of construction along the AA/M Route Alternative. With some modifications, these are summarized below. None of these potential impacts would be incurred by the Proposed Project.

Ground Water

During excavation and burial of pipeline, disruption of shallow aquifers would occur temporarily. Localized dewatering and increased turbidity impacts would be negligible. Effects would probably not be noticed except in very shallow wells immediately adjacent to the pipeline.

Surface Water

Increased sediment loads and possible localized channel degradation could occur. Increased sediment loads would result from trenching the streambed and the runoff from disturbed areas on the banks reaching the stream. Other impacts from construction include substrate removal, habitat alteration, and removal of riparian vegetation.

Topographic Alterations

Excavation and grading associated with construction of the pipeline and pumping stations would result in temporary (construction period) and permanent changes in topography, and minor disturbance of geologic units. The anticipated scale of grading operations associated with trench excavations and backfill, and cuts and fills at pumping stations, would be minor. Thus, no significant impacts to the geology and topography of the project area would occur.

Karstic Terrain

The use of blasting to excavate trenches in hard limestone could trigger sinkhole collapse or subsidence. The presence of hidden karstic limestone during construction may be revealed by blasting-induced sinkhole development. Their presence would necessitate localized mitigation by route alteration to avoid the problem area or specialized construction techniques such as backfilling of the collapsed zone.

Aquatic Biology

The effects of construction on aquatic communities could include reductions in plant and benthic macro-invertebrate abundance, and displacement or possible reduction in resident fish populations. Significant reductions to fish populations would occur if important spawning or juvenile rearing areas were covered by increased sediment or removed from the stream. Sediment-related impacts would be considered short term in duration, generally less than one year or one life cycle for fish and several months for other aquatic communities. In summary, no significant impacts would be expected in streams or downstream reservoirs as a result of increased sedimentation and minor temporary habitat alteration.

Terrestrial Biology

Certain species of ground-nesting birds would be precluded from nesting in the ROW until reclamation would be completed. Areas that had supported woodland habitats would be changed to grasslands or shrublands. Because a linear facility would disturb relatively little land in any one area, impacts of habitat loss or alteration are not considered to be significant.

Protected Species

The Bald Eagle nests along river systems or within one to two miles of other large bodies of water, such as lakes and reservoirs. Nests are often located in areas where forests, marsh, and water meet. Nests are most often in tall trees that are generally above the surrounding forest

canopy, which provides an unobstructed flight path to nest. Tree species most often used include loblolly pine, bald cypress, oak, cottonwood, and sycamore. Construction of a new pipeline through Bald Eagle habitat could adversely affect nesting birds, if such activities were undertaken during nesting season.

The Interior Least Tern is known to occur along major rivers and tributaries in central Texas. If pipeline construction were to cross such features during the summer, impacts from noise and activity could disrupt nesting birds. Although nesting success could be affected if construction were to coincide with nesting, most (if not all) river and major stream crossings would be by directional drilling and loss of habitat is not anticipated.

Navasota Ladies'-tresses are endemic to southeast Texas and occurs primarily in moist sandy soils in small openings amongst Post Oak Savanna. Construction through the Navasota and Brazos watersheds could result in some loss of individual plants and short-term loss of habitat. Long-term impacts to the species could occur if herbicides are used for ROW maintenance and brush control.

The Black-capped Vireo is known to breed and nest in portions of the Edwards Plateau that would be crossed by the pipeline. Preferred habitat consists of scattered trees and dense clumps of shrubs growing to ground level, interspersed with open areas of barren ground, rock, grasses or forbs. The species is migratory and winters in Mexico. Pipeline construction could result in some loss of habitat. If construction coincided with the nesting season, it also could affect nesting success.

The Golden-cheeked Warbler is known to breed and nest in portions of the Edwards Plateau that would be crossed by the pipeline. Habitat requirements are characterized as oak-juniper woodlands, including mature Ashe junipers that provide nesting substrate. The species is migratory, wintering in central Texas. Construction of a new pipeline could result in some loss of habitat. If construction were to take place during the spring and summer nesting season, noise and activity could result in reduced nesting success along the pipeline corridor.

The Concho water snake is restricted to a few reaches of the Concho River below Veribest and in the Colorado River upstream and downstream of the Concho River confluence. Extensive field searches have failed to locate this species in other regional streams or other sections of the Colorado River. The pipeline route crosses the Colorado River in a reach just upstream of where Concho water snakes are known to occur. It is unclear if surveys have been conducted at the exact pipeline crossings; therefore, it is possible that Concho water snakes also occur there. Exact alignment at the Colorado River could reduce impacts to this species (impacts

would be greatest in shallow riffles and least in deep water). It is possible that construction in a riffle area would reduce numbers of this species, but should not jeopardize the population.

Cultural and Historic Resources

Forty-two cultural resource sites are known to exist within the 100-foot construction ROW for the AA/M Route Alternative. However, numerous additional sites are likely to be within the corridor ROW. Extensive cultural resources investigations would be needed to fully assess and mitigate potential impacts to archaeological and historical sites.

Land Use and Recreation

No county would have more than 1 percent of its cropland disturbed by the AA/M Route Alternative. Landowners would be compensated for losses resulting from delays in planting and harvesting. Shrub and rangeland represents about 40 percent of the land that would be crossed by the pipeline. Temporary gates and other measures would be erected to prevent livestock from escaping. Grazing land would be impacted for only a short period of time; the largest disturbance would occur in Irion County. Grazing would again be possible after restoration. Areas of concentrated residential use would be limited to less than 1 percent of the total land crossed.

No adverse impacts would occur to designated recreation areas during normal construction and operation activities. There are no wilderness areas, national parks, historic sites, or state or local parks located along the AA/M Route Alternative. Recreational activities are limited. Nevertheless, recreational expenditures along the route could be affected by pipeline construction.

Transportation

The AA/M Route Alternative would intersect many major state and federal roads plus numerous county roads, minor public and private roadways, and railroads. Alternative access routes should prevent significant impacts, however. Adverse effects would be short term and not significant.

9.1.2.2.2 Evaluation of the AA/M Route: Impacts of Pipeline Operation

As with the Proposed Project, the operation of a new pipeline along the AA/M Route Alternative would have no impacts from routine operation, but could potentially impact the environment and human safety along the pipeline in the event of pipeline failure. The non-site

specific impacts of operation would be similar for both the Proposed Project and the AA/M Route Alternative. These include the following:

Population

Since a formal alignment for the AA/M Route Alternative has not been platted or surveyed, it is presumed that a route minimizing impacts to population would be selected. Some unavoidable population density may be encountered when crossing the I-35 corridor between the cities of Temple and Waco.

Overall, the AA/M Route is likely to have less affected population (i.e., reside within 1250 ft of the pipeline) than does the Proposed Project route. Both routes have the densely populated Houston area in common, but the AA/M Route would avoid the populated areas of south Austin and Travis County.

Ground Water

The AA/M Route Alternative would, as it is designed to do, avoid the sensitive and hypersensitive portions of the Edwards Aquifer (BFZ), Colorado River Alluvium, Edwards Aquifer (BFZ), Ellenburger-San Saba Aquifer, Marble Falls Aquifer, Hickory Aquifer, and much of the karsted Edwards-Trinity Aquifer. Although much of the proposed route that would be bypassed by the AA/M Route Alternative is not rated as “sensitive” or “hypersensitive” because of the lack of proximal drinking water supplies, many of these aquifer formations that are crossed by the AA/M are potentially environmentally sensitive. Overall the AA/M Route Alternative would reduce the threat from a potential major release to these formations.

The AA/M Route Alternative does pose some ground water resource risks. While the AA/M route does not cross hypersensitive aquifer features such as the Edwards—some of the aquifers crossed – particularly the Sparta, Carrizo-Wilcox, and Queen City aquifers, are hydrogeologically sensitive. The City of Rockdale public water supply (PWS) wells are located within 2 miles of the AA/M Route Alternative. These wells could potentially be contaminated by any releases to this aquifer as discussed in Section 4.2.1.1.1.

Only one additional aquifer would be crossed by the AA/M Route Alternative (as opposed to the bypassed portion of the Proposed Project route)—the Lipan Aquifer in Concho and Tom Green counties. The Lipan Aquifer is generally not suitable for public or drinking water supply and not considered sensitive. A comparison of aquifers crossed is shown in the table below.

Comparison of Aquifers Crossed by the Proposed Project and the AA/M Route Alternative

Aquifer	Crossed by Longhorn	Crossed by AA/M Route Alternative
Gulf Coast Aquifer System	X	X
Brazos River Alluvium Aquifer	X	X
Sparta Aquifer	X	X
Queen City Aquifer	X	X
Carrizo-Wilcox Aquifer System	X	X
Colorado River Alluvium[a]	X	
Edwards Aquifer (BFZ)	X	
Trinity Aquifer	X	X
Hickory Aquifer	X	
Lipan		X
Ellenburger-San Saba Aquifer	X	
Marble Falls Aquifer	X	
Edwards-Trinity Aquifer	X	X

[a] The Colorado River Alluvium is not a Texas Water Development Board (TWDB) designated minor aquifer.

Overall, the AA/M route is the environmentally superior route with regard to potential impacts of operation on the ground water.

Surface Water

Three major surface water basins that would be crossed by the AA/M Route Alternative are the Brazos, Colorado, and Rio Grande. Seven major channels of major sensitive rivers or streams would be crossed, as described in Appendix 9B.

A major surface water concern of the proposed route, the threat of contamination of the Highland Lakes from crossings of many of the streams and rivers in the Colorado River watershed, is avoided by the AA/M Route Alternative. While the Colorado and numerous tributaries in the watershed are crossed by the alternative, these are far upstream of the Highland Lakes, and therefore pose much less danger to the use of water in the lakes for domestic water supplies. Lake Buchanan, the most upstream of the Highland Lakes, is approximately 130 miles downstream of the Colorado River crossing for the AA/M Route Alternative.

However, a number of PWS would be threatened by a major release from the AA/M Route Alternative. Most notable are:

- Twin Buttes Reservoir, 16 miles downstream on the South Concho River from the crossing of the AA/M Alternative;

- Waco Lake, 14 miles downstream on South Bosque Creek from the crossing;
- Somerville Lake, 12 miles downstream on Middle and East Yegua Creeks; and
- Cameron City Reservoir, 7 miles downstream on the Little River.

Twin Buttes Reservoir is the surface water supply for San Angelo; Waco Lake services Waco; Cameron City Reservoir services the City of Cameron; and Somerville Lake services Brenham. The crossings of these rivers and streams, therefore, are considered hypersensitive for surface water quality.

Other PWS that could be adversely impacted by a release along the AA/M Alternative include:

- The PWS for the City of Goldthwaite in Mills County, 80 miles downstream of the Colorado River crossing;
- Stillhouse Hollow Reservoir, 75 miles downstream of the Lampasas River crossing; and
- Belton Reservoir, 50 miles downstream of the Leon River crossing.

For a number of reasons, the potential impacts to the potability of the reservoirs impacted from a release contaminating the South Concho River, Bosque Creek, Little River, or the Yegua Creeks, and thus impacts to the drinking water supplies for San Angelo, Waco, Cameron, or Brenham may be greater than the potential impacts posed by any releases to the Highland Lakes.

First, these reservoirs have a lower volume than the Highland Lakes which could be potentially affected from a release in the Lower Colorado watershed and thus a major release may cause higher concentrations of contaminants in the drinking water supply. Second, the travel distances are short enough to greatly reduce the amount of contamination which could be controlled prior to entering the reservoir. Finally, for Twin Buttes Reservoir, the lower rainfall rates in the Upper Colorado watershed suggest that contamination may take longer to dilute to below drinking water thresholds, although more complete modeling of volatilization and recharge rates in the reservoir would be necessary to make a conclusive determination.

Overall, the Proposed Route appears to pose fewer surface water impacts (as measured by drinking water sensitivity) that would the AA/M Route Alternative.

9.1.2.2.3 Technical and Cost Feasibility of the AA/M Route Alternative

The Settlement requires that the route and other alternatives addressed in the EA be "reasonable." [e.g., paragraph 4(a) on page 3 and Attachment B, paragraph C(2) on page B-7.] NEPA guidance (46 FR 18028, March 23, 1981) defines "reasonable" as taking into account technical and economic feasibility.

No technical barriers to implementing the AA/M Route Alternative are known. Standard construction techniques would be employed (including heavy-walled and double-coated pipe, and bores and directional drills under most streams, all roads, and railroads). However, according to information provided by Longhorn, the costs and delays to Longhorn are substantial for this alternative. The total construction costs have been estimated by Longhorn to be $135 million, excluding the costs for pumping stations. The number of pumping stations would range from three to five, each costing approximately $3 million.

Longhorn estimates the major cost component to include approximately $53 million for construction labor, $51.6 million for materials (most of which is the 0.281-inch and 0.375-inch pipe sections) and $17.9 million for ROW acquisition.

This construction would delay operation of the System for 18 to 24 months. This excludes any delays related to environmental and other issues. Longhorn estimates that a two-year delay would result in "lost opportunity" costs of $299 million. These lost opportunity costs include the loss of profit from product transport during the years 2000 and 2001.

9.1.2.3 Summary Comparison of the Proposed Project and AA/M Route Alternative

Table 9-1 summarizes the comparative environmental impacts of the Proposed Project and the AA/M Route Alternative. The principal advantages and disadvantages of the AA/M Route Alternative are listed below:

- It would avoid the Edwards Aquifer, the Colorado Alluvium and three other minor aquifers (Hickory, Ellenburger-San Saba, and Marble Falls) and therefore eliminate the possibility of spills to these aquifers;
- It would avoid the entire Austin area with attendant risks to population and natural resources; and
- Because of the installation of new pipe for the entire route, the higher uncertainties associated with the integrity of the older would be eliminated. Additionally, associated improvements in pipe strength, corrosion prevention

(new coating system), ROW (cleared with no encroachments), and greater depth of cover, would all reduce risks of pipeline operation.

The disadvantages of the AA/M Route Alternative are as follows:

- It would require 370 miles of new construction with attendant construction-related and short term impacts to the following resources: ground water, surface water, topographic alterations and karst terrain, aquatic and terrestrial biology, threatened and endangered species, cultural and historic resources, land use and recreation, and transportation. Also the acquisition of the AA/M ROW could result in condemnation proceedings. None of these construction-related impacts would be incurred by the Proposed Project.
- It would pose risks of spills and leaks to surface water and other rural and small town populations that are not now subject to these risks; and
- The costs of this alternative have been estimated by Longhorn at $135 million (not including pump stations) and the construction could result in an 18- to 24-month delay in shipping product. Lost opportunity costs of the delay would be approximately $300 million.

On balance, the impacts of construction of 370 miles of new pipeline together with the potentially higher surface water impacts do not justify designating the AA/M Route as the environmentally preferred alternative, especially in light of the extensive mitigation required (in Section 9.2) along the existing route.

9.1.3 The Austin Re-route Alternative

9.1.3.1 Description of the Austin Re-route Alternative

The Settlement requires the evaluation of an alternative route that would avoid "populated areas in and around the City of Austin." Longhorn identified a route that would minimize population exposure and that would take into account environmental concerns and other factors that would normally be considered in siting a new pipeline. The route departs from the existing Longhorn pipeline southwest of the Austin-Bergstrom International Airport and extends to the south of the existing Longhorn pipeline into northern Hays County before heading north and rejoining the existing pipeline west of Austin.

9.1.3.2 Evaluation of the Austin Re-route Alternative

The Austin Re-route Alternative would replace a 12-mile segment in south Austin with a 21-mile segment that loops further south. This alternative route is shown in Figure 3-1 and in

Figures 9-1 and 9-2. Its purpose is to avoid populated areas in and around Austin. In accordance with the Settlement, Longhorn developed a route that minimized population exposure. It is estimated that the 12-mile segment of the existing pipeline that would be replaced by the Austin Re-route Alternative lies within 1,250 ft of 8,750 residents. By comparison, the Austin Re-route would come within 1,250 ft of only 550 residents, more than a 90 percent reduction.

9.1.3.2.1 Human Resources and Land Use

Chapter 4 identified human resources along the Austin Re-route Alternative, including population sensitive areas. As noted above, the primary purpose of the route was to avoid populated areas. This alternative currently accomplishes this, however, the Austin Re-route crosses portions of far south Travis County and northern Hays County near the I-35 corridor. These areas are currently subject to heavy development pressures.

Dwelling counts made for this EA indicate approximately 70 dwelling units are within 1,250 ft of the Austin Re-route Alternative. The greatest concentration located within 1,250 ft of the pipeline is between milepost (MP) 2.9 and MP 3.4 of the Austin Re-route as shown in Figure 9-1. Contacts with local officials indicated that no new schools, parks, or other public facilities are planned along the portion of the Austin Re-route at this time. Given the announced plans for large residential and retail/office developments for portions of the area along the Austin Re-route, however, land use conflicts could occur should Longhorn attempt to acquire this ROW for use as a route alternative through south Austin.

9.1.3.2.2 Physical Resources

Ground Water Resources

Ground water resources along the Austin Re-route Alternative were identified and described in Chapter 4. Much of the pipeline passes over sensitive and highly sensitive aquifer formations – the length of hypersensitive aquifer traversed by the Re-route is 8.2 miles, which is much longer than the length crossed by the existing pipeline, 2.9 miles. The Austin Re-route would more than double the amount of hypersensitive aquifer crossed by the bypassed portion of the Proposed Project route.

During any construction activities, adherence to a strict runoff control plan and identification of sensitive karstic features would be necessary to avoid contamination of ground water or damage to recharge features for the aquifer.

Potential impacts to ground water resources that could be affected by a release along the Austin Re-route are the same as those identified in Chapter 7 for the Edwards Aquifer (BFZ). It is possible, because of the nature of this aquifer formation, for the contamination to travel the additional distance in a relatively short time. Therefore, the risk posed to private and PWS and to Barton Springs from a potential release is as great as the risk from the proposed route. However, because of the 280 percent increase in pipeline length over the Edwards Aquifer (BFZ), the Austin Re-route may pose a greater overall threat to PWS and Barton Springs.

Surface Water Resources

Surface water resources along the Austin Re-route Alternative were identified and described in Chapter 4. The Austin Re-route has 14 stream crossings, 8 more than the bypassed portion of the existing route. A number of these streams were rated as "medium" or higher for flooding, indicating that flooding in these streams could aid movement of contaminants from a pipeline release downstream before they could be controlled. All 14 stream crossings along the Re-route are upstream of, and relatively near, important water supplies, and thus are rated as sensitive for surface water impacts if a release were to occur at these points.

Each of these streams can contribute to the Colorado River Alluvium, and thus a release contaminating any stream could impact the Bastrop water supply wells which draw from the alluvium. In addition, there is a small PWS intake on Onion Creek downstream of the creek crossing as well as the creek's confluence with a number of tributaries that are crossed by the Re-route.

There are not expected to be major construction-related impacts to surface waters from the Re-route, because stream crossings would be directionally drilled.

9.1.3.2.3 Ecological Resources

Ecological resources along the Austin Re-route are identified in Chapter 4. The primary potential impact that could result from a release along the Austin Re-route would be damages to the Barton Springs Salamander, because of the mechanisms for contamination of the Edwards Aquifer (BFZ) noted in Section 7.4.4. Any releases along the Austin Re-route that conducted contaminants to Barton Springs could threaten Salamander populations and habitat.

Other protected species that could be affected by a release, particularly if a large amount of cleanup was involved, include Golden-cheeked Warbler and Black-capped Vireo populations which could inhabit the flora along the Austin Re-route Alternative. Construction of the Austin

Re-route could potentially require clearing a 50-ft wide strip through portions of existing habitat, although additional ground level surveys would be required to establish this impact.

9.1.3.2.4 Cultural Resources

A cultural resource survey of data sources was performed to determine the presence of any archeological and historical resources that could be adversely impacted by construction or spill response along the Austin Re-route corridor (Section 4.4.2). Eight prehistoric sites and one historic site were noted within a 2,000-ft-wide corridor, although none of these sites are known to contain the kinds of information that would make them eligible for listing in the National Register or gain designation as State Archeological Landmarks. Thus, no threatened impacts to cultural resources are suspect to occur from the construction of the Austin Re-route, although construction activities could turn up cultural resources that are not now identified.

9.1.3.3 Comparison of Advantages and Disadvantages of the Austin Re-route Alternative

A summary of advantages and disadvantages of this line is as follows.

The advantages to the Austin Re-route Alternative are as follows:

- It accomplishes the goal of substantially avoiding population.
- It would use new pipe (possibly heavier walled) with new coating with increased depth of cover and other risk reductions associated with new line.
- It would be easier to re-establish a clear ROW given that there are several encumbrances that have been allowed to develop over the existing pipeline ROW.
- It would provide increased contaminant travel distances to Barton Springs Pool, a valuable resource for drinking water, endangered species habitat, and recreation. This would allow more time to respond to spills and possibly greater dilution of contamination.

The disadvantages to the Austin Re-route Alternative are as follows**:**

- Northern Hays County is undergoing rapid growth. Capitol Area Planning Council cites a 3 percent per annum growth in Hays County since 1997, and the same growth rate in the town of Buda, which is within 1/2 mile of the Austin Re-route. This puts the pipeline in the path of development with increased risk of third party damage and creates the possibility that at some point in the future the

population along the Austin Re-route will equal or exceed the current population along the pipeline.[1]

- Many pipeline risks are directly proportional to length of a pipeline. The Austin Re-route is 9 miles longer than the portion of the Proposed Project route.
- Establishing new ROW for the Austin Re-route will require clearing of approximately 15 miles through potential Golden-cheeked Warbler habitat; a maximum of 180 acres of wildlife habitat would be affected during construction and 45 acres would be permanently lost through ROW maintenance.
- The Austin Re-route does not reduce the number of pipeline miles crossing hypersensitive leached/collapsed and Kirschberg Evaporite members of Edwards Aquifer (BFZ). Also, by increasing the number of crossings of creeks in the recharge zone (new crossings of Little Bear Creek and Bear Creek will occur), there is increased potential for damages to the Edwards Aquifer from a release.
- Since the Austin Re-route would pass approximately five miles south of the Proposed Project route through the Edwards Aquifer (BFZ), and since ground water movement in this zone is south to north, the re-route would greatly increase the number of private and public wells at risk of contamination from a release.

In summary, the Austin Re-route Alternative raises several new environmental issues. Compared to a heavily mitigated (including some pipe replacement) pipeline over the existing route, the net environmental impacts of the construction and operation of the Austin Re-route are questionable.

9.1.4 El Paso Lateral Alternatives: Proposed Fort Bliss Route and Montana Avenue Alternative

9.1.4.1 Description of the El Paso Lateral Alternatives

Longhorn's proposed route for the three yet-to-be constructed 8.3-mile-long laterals connecting the El Paso Terminal to the Kinder Morgan and Chevron pipelines would pass through Fort Bliss. Longhorn has developed an alternative route that would be used if Fort Bliss authorities were not to approve the use of Fort Bliss property for a right-of-way (ROW). This route alternative, the Montana Avenue Alternative, runs west from the El Paso Terminal to the Kinder Morgan and Chevron pipelines along Montana Avenue. Both the Fort Bliss and the Montana Avenue Routes are described in Chapter 3 of this EA and depicted in Figure 3-1.

[1] Between the time that the Austin Re-route was mapped in the spring of 1999 and this EA was completed in the fall of 1999, several major residential and commercial developments were announced in September that would conflict with this route.

9.1.4.2 Comparison of the El Paso Montana Avenue Alternative and the Proposed Fort Bliss Route

As described in Chapter 3, construction on the Longhorn pipeline is complete with the exception of two short segments:

- A 2,500-ft connection between the current terminus of the Odessa lateral and the Equilon Terminal, and
- An 8.3-mile segment between the El Paso Terminal through Fort Bliss property to the tie-in points with three interstate pipelines that will transport refined products to New Mexico and Arizona.

The 2,500-ft extension of the Odessa Lateral extension does not raise any issues because of the route's short distance over non-sensitive, vacant land south of Odessa. When Longhorn constructed the Odessa lateral, the pipeline was terminated at its present location where Longhorn intended to build its own terminal. The need to extend this lateral another 2,500 ft north reflects Longhorn's agreement with Equilon to use Equilon's products terminal instead of building a new one.

The Settlement requires that the EA compare the Proposed Fort Bliss Route with the Montana Avenue Alternative. Both routes are compared below.

9.1.4.2.1 Comparison of the El Paso Montana Avenue Alternative and the Proposed Fort Bliss Route: Construction Impacts

Both routes would entail temporary impacts associated with pipeline construction. These include short-term noise, dust, and interruption of traffic flow. However, because the Montana Avenue Alternative would be constructed along a busy El Paso arterial, it would have greater impacts.

The Montana Avenue Alternative would require construction along an 8-mile portion of Montana Avenue to an industrial area near the El Paso International Airport. Approximately 1.5 miles of the western portion of the route would be on the south side of Montana Avenue; the remainder of the alignment would be along the north side of the road. Montana Avenue would be crossed at two locations by directional drilling. Loop 375 would be crossed at one location by directional drilling. Access to a mobile home park (Quail Run), several industrial/commercial sites, and county administration facilities would be crossed by trenching.

The Fort Bliss Route would require construction within Fort Bliss to a proposed tie-in site along Loop 375 (Joe Battle Boulevard). A gravel road that is used as access along the south side of the Fort Bliss property line would be crossed by trenching; Loop 375 would be crossed by directional drilling. The Fort Bliss Route would avoid developed areas as shown in the land use map and descriptions in Chapter 4.

9.1.4.2.2 Comparison of the El Paso Montana Avenue Alternative and the Proposed Fort Bliss Route: Third Party Damage and Reduced Safety Risks

Because the Montana Avenue Route Alternative lies along an area that is partially developed and is likely to develop more as El Paso expands to the east, it is subject to greater potential for third party damage to the pipelines. Moreover, the City of El Paso water and wastewater pipelines that lie along Montana Avenue. Work on these pipelines in the future pose the risk of third party damage to the pipeline laterals. The Proposed Fort Bliss Route would be on undeveloped federal property that is off-limits to development and therefore poses minimal third party risks.

Furthermore, should an accident occur on the three laterals, there would be more persons at risk along the Montana Avenue Alternative. An estimated 3,755 persons live within 1,250 ft of the Montana Avenue Alternative as compared to 232 persons within 1,250 ft of the Fort Bliss Route. The residents within 1,250 ft of the Montana Avenue Route Alternative are in 12 subdivisions, apartment complexes, and mobile home parks. The residents within 1,250 ft of the Fort Bliss Route are in the Butterfield Square subdivision.

In addition to the residences, the Montana Avenue Alternative would pass within 1,250 ft of other sensitive receptors including two churches, a new Ysleta Independent School District Elementary School, and several businesses. No such sensitive receptors were identified along the Fort Bliss Route.

9.1.4.2.3 Comparison of the El Paso Montana Avenue Alternative and the Proposed Fort Bliss Route: Biological and Cultural Resources

Based on biological and cultural resource surveys already completed, the Fort Bliss Route poses no impacts to these resources. Fort Bliss has completed biological and cultural resources investigations along the proposed Fort Bliss Route and has determined that federally-protected resources would not be adversely impacted. According to John Barrara, Fort Bliss Environmental Manager, permission to construct and operate the laterals within Fort Bliss

property has been tentatively granted, although the Settlement precludes formal approval pending the outcome of the EA.

Similar studies have not been conducted along the Montana Avenue Route Alternative. However, because much of the area along the route has been previously disturbed for development, any cultural resources and biological resources that would have been impacted would have already been affected by road and infrastructure construction.

9.1.5 Proposed Project (with Mitigation)

The Proposed Project (with mitigation) is defined as the Proposed Project, as described in Chapter 3 along with the application of the mitigation measures in the Longhorn Mitigation Plan (LMP). Mitigation measures are actions that would avoid, reduce, or compensate for the impacts predicted to occur. The Settlement includes the alternative routes as potential mitigation measures in addition to several types of pollution prevention measures[2] required to be evaluated as a part of this EA. These mitigation measures listed in the Settlement include: enhanced leak detection; enhanced ground surveillance; replacement of pipe sections with new or double-wall pipe; increased depth of buried sections; enhanced emergency response capability; additional block or check valves and remote operation capability; berms, or other containment for sections or other facilities; and other mitigation measures that arise from integrity analysis or from risk assessment. These are described in Chapter 3. Most of these pollution prevention measures, along with additional ones, are included in the LMP. Table 9-2 lists and discusses the effectiveness of each of the mitigation measures in the LMP.

The Lead Agencies' approach to the development of mitigation measures focuses on reducing the probability of leaks and spills through application of mitigation measures over the entire System with increasingly more stringent measures over sensitive and hypersensitive areas. Appendix 9C contains a listing of the approximately 102 miles of sensitive areas, which also include about 22 miles of hypersensitive areas. Appendix 9D contains the LMP.

9.2 MITIGATION MEASURES

The Lead Agencies have determined that there are potential impacts associated with the Proposed Project that arise from the risk of pipeline failure. Mitigation measures are designed to avoid or reduce adverse impacts. The Lead Agencies have determined that mitigation measures

[2] The Settlement refers to these measures as "pollution control alternatives." This EA uses the term "pollution prevention measures" because pollution prevention best describes the intent of the measures. Pollution control suggests a response to a spill or a leak rather than prevention of the release.

are necessary to reduce the potential impacts of the Proposed Project to a level of insignificance. These mitigation measures (described in detail below) in many cases go substantially beyond the legal requirements that apply to U.S. hazardous liquid pipelines.

9.2.1 Introduction

This EA concludes that the Proposed Project does not pose significant impacts when the System is operating in a routine manner. That is, there are no significant impacts that are certain to occur at any given location, such as unacceptable noise from pump stations; routine releases of unacceptably high levels of air contaminants from valves, flanges, or product tanks; hazardous liquid effluent discharges or solid waste generation; or disturbance of threatened or endangered species.

Rather instead, there are varying probabilities that accidents could occur along the System. Should these accidents occur, impacts to the environment and human health and safety could be significant. The mitigation measures reduce the probabilities of failure with even greater risk reductions in those areas along the pipeline where environmental sensitivities and population densities are highest. The mitigation measures also reduce the impacts of a spill should they occur.

9.2.2 Approach

Risks along the pipeline are assessed in Chapter 6 using the EA Risk Assessment Model. As explained in detail in Chapter 6, the EA Risk Model provides an objective means of incorporating the many factors that can cause pipeline failure into a single score for a segment of pipeline. For this EA, the model produced relative risk scores for more than 8,000 segments of the System along the entire route based on many individual risk factors. The extreme ends of scores associated with the EA Risk Model produce a theoretical range of scores from 0 to 400 (although the extremes can only be approached in theory). The risk formula produces higher scores for pipe segments with lower risks (i.e., a “400” score is a hypothetical pipeline segment with near zero risk; a “0” score is a hypothetical pipeline segment at risk of imminent failure).

As required by the Settlement, the Lead Agencies developed a draft list of mitigation measures. The draft mitigation measures allowed Longhorn some flexibility in selecting mitigation measures that collectively reduce impacts, with additional and more stringent mitigation measures for sensitive areas and for hypersensitive areas. Sections 9.2.2 through 9.2.4 describe how the EA Risk Model and designation of sensitive and hypersensitive areas were employed to bring this about.

Longhorn developed its own mitigation plan pursuant to explicit requirements regarding specific mitigation from the Lead Agencies. Section 9.2.5 explains how to interpret the LMP which is contained in Appendix 9D.

The most effective way to mitigate risks is to reduce spill probability. The alternative of reducing spill consequences involves the reaction to a leak, which is often less effective than preventing the leak.

As previously described in Chapter 6, the relative probability of pipeline failure is quantified in a variable called "Index Sum." The Index Sum is a summary number that includes all variables that affect spill probability. These variables are grouped into the four categories of third party damage, corrosion, design, and incorrect operation—each of which corresponds to a historical cause of pipeline accidents.

As noted earlier in this chapter, the higher the Index Sum, the lower the risk of pipeline failure. Therefore, the Index Sum can be viewed as a relative "safety scale," whereby increasing points mean increasing safety—lower failure probability. Unfavorable conditions around the pipeline, inadequate operator activities, and increasing uncertainty (about existing conditions) all tend to reduce Index Sum scores—indicating a higher failure probability. Mitigation measures that improve pipeline condition increase the index sum score.

The Index Sum value generally correlates with a relative failure probability scale and as is shown graphically in Figure 9-3 and described in the following paragraphs. The two scales in this figure show qualitatively how the Index Sum relates to failure frequencies.[3]

The relationship proposed in Figure 9-3 was developed from incremental Index Sum scores derived for the Longhorn pipeline and from published pipeline accident rates. Index Sum scores for certain segments of the pipeline are shown on a linear scale (the upper scale shown in Figure 9-3). Pipeline accident rates for several companies and groups, as discussed in Chapter 5 are shown on a second scale (the lower scale). While these accident rates are shown as points, the number actually represents the average of some distribution of accident rates—the company will have pipelines with both higher and lower accident rates than the company's average.

[3] An absolute correlation between the two scales is not possible because of the absence of data correlating relative risk rates nationwide. One key assumption underlies the displayed correlation, namely, that the failure statistics quantified by the sources cited reflect pipeline systems that are comparable to the Longhorn pipeline. This conceptual linkage between the accident rates and risk scores, reflecting pipeline conditions, is used here because of the limitations of available pipeline industry data. There is no known database correlating accident rates to pipeline characteristics and conditions.

A single connection point between the two scales was developed from the Index Sum score of 189 for the average recent operation from J1 to Crane. This score is estimated to be comparable to the accident rate of 0.71 accidents per 1000 miles per year experienced by the EPC pipeline during the last five years of EPC operation (1991-1995) and, coincidentally, by the entire Williams Energy Company from 1990-1997.

A second connection point between the two scales is the theoretical link between the highest theoretical score of 400 with a near zero accident rate. Using only these two data points, the accident rate scale was then compressed so that the two connection points overlaid with the connecting Index Sum scores. This compression resulted in the nonlinear accident rate scale shown in Figure 9-3.

These two relative scales reflect several propositions that the Lead Agencies believe are accurate with respect to hazardous liquid pipelines:

- Most pipelines in the United States have a risk level lower (i.e., higher EA Risk Score) than the minimum DOT compliance level;
- The risk level of the Longhorn pipeline, while under EPC operation, was relatively high as is evidenced by the relatively high accident rate; and
- As safety improves, it becomes increasingly difficult to further reduce spill frequency.

9.2.3 Identification of Sensitive and Hypersensitive Areas

The selection of sensitive and hypersensitive areas along the pipeline is based on the sensitivity of the existing environment (Chapter 4) and potential impacts (Chapter 7). Areas were identified as sensitive based upon proximity and density of population, ground water (with an emphasis on drinking water supplies), surface water, presence of threatened and endangered species habitats, and proximity to recreational areas. Appendix 9C explains how these areas were identified.

Of the total 694 miles between GATX and El Paso, 102.2 miles are designated as sensitive. Within this 102.2 miles are 21.7 miles of hypersensitive areas. Appendix 9C provides tables showing the exact locations by mileposts of the sensitive and hypersensitive areas along with notes describing why these areas are sensitive and hypersensitive.

Both Figures 9-1 and 9-2 are large foldout maps of the entire pipeline with enlargements of the Houston and Austin areas. These maps show the location of the sensitive and

hypersensitive areas as well as pipeline risk conditions. These sensitive and hypersensitive areas are shown as green strips that are located above and parallel to the pipeline. The light green portion of the strips depicts sensitive areas; the dark green portion of the strips embedded within the light green strips depicts hypersensitive areas. The text boxes in the figures generally identify the sensitive and hypersensitive areas.

9.2.4 Setting EA Risk Target Levels

Risk target or Tier levels were established as guidelines for determining the mitigation measures necessary to reduce impacts to a level of insignificance along the entire pipeline; recognizing that additional and more stringent mitigation measures are required in the more sensitive areas.

As discussed in Section 9.2.2, a direct correlation between all points on the two relative scales of index sum and accident rates does not exist due to data limitations. However, there is sufficient knowledge and experience of hazardous liquid pipeline operations to establish relative target levels based on the use and effectiveness of mitigation measures.[4]

The first index sum target level is termed Tier I and sets a minimum guideline for mitigation measures required for the entire pipeline. The Tier I level was nominally set at 200 points. This is the only point where there is a direct connection between the index sum scale and the accident rate. Based on the relative correlation between the index sum and the historical accident rates, the Tier I target level reflects a failure rate lower than the national average for similar systems operated by other companies in the United States.

Based on DOT's experience with similar pipeline systems, the mitigation measures required to achieve this target level exceed DOT requirements and are at a level comparable with common industry practices. This is a reasonable minimum standard for the entire pipeline.

The second target level is called Tier II. It is the minimum level for all segments of the pipeline that are in "sensitive areas," as defined in Section 9.2.3. That is, no portion of the pipeline in a sensitive area should have a score lower than this value, set nominally at 240. The

[4] Each measure that affects spill probability has an associated point score in the EA Risk Assessment. By accumulating points with application of mitigation measures the target levels can be attained, and hence, risk reduction is demonstrated. In all cases of complying with the Tier requirements, the components of the Index Sum, the four indexes that correspond each to a specific failure mode, must be in reasonable "balance." An excess in any individual index can mask a deficiency in another, when only the Index Sum is considered. For example, if the target score were obtained by solely focussing on corrosion control, neglecting protection from third party damage, or from incorrect operation (human error), the apparent reduction in failure rate is less than what could occur if all failure modes share in the improvement.

mitigation measures required to achieve this target level compares to best industry practices applied to pipelines in a benign environment. A benign environment refers to threats to the pipeline integrity, such as landslide potential, third-party construction activities, highly corrosive soils, crossings by other buried utilities, etc.

The third target index sum level, called Tier III, is the minimum level for all segments of the pipeline which are in "hypersensitive" areas. That is, no portion of the pipeline in any hypersensitive area should have a score lower than this value. This level is 280 points on the EA Risk Model. This Tier III target number is the index sum that can only be achieved by implementing a combination of mitigation measures that corresponds to a new pipeline in a "very" favorable (benign) environment. This level of mitigation is more stringent and comprehensive than is currently in practice by similar pipeline systems.

It is important to reiterate that the Tier I, II, and III index sum target levels are used as a starting point in determining appropriate means of reducing risks associated with the pipeline. Although achieving the applicable EA Risk Model target score was treated as a minimum requirement for all segments of the line, achieving that target score was not treated as sufficient to establish that failure-related risks had been adequately mitigated. Instead, after ensuring that the target scores were achieved, the Lead Agencies' focus shifted to ensuring that appropriate combinations of protective measures were in place with respect to each pipeline segment. For example, the LMP contains numerous mitigation measures intended to reduce the consequences of a spill should it occur. See examples in Table 9-2. Because the Index Sum relates only to pipeline failure probability, rather than to the consequence of a spill, mitigation measures of this kind do not result in improved Index Sums.

Figure 9-4 shows how the three tier levels correspond to the top scale in Figure 9-3.

9.2.5 Description and Interpretation of the Longhorn Mitigation Plan

Longhorn has developed the LMP that contains the detailed descriptions of the measures that will be implemented to reduce the risks of leaks and spills during the pipeline operation. The complete LMP is provided in Appendix 9D.

In the LMP, Longhorn has made a number of specific commitments that address the four leading causes of pipeline failures: outside force damage, corrosion, operator error, and material defects. In addition, Longhorn makes several commitments that address the detection and containment of pipeline leaks. The Longhorn Mitigation Commitments (LMC) are summarized in Table 9.2. Detailed descriptions of the individual commitments are included in the LMP.

In addition to the Introduction, the other sections of the LMP include the Project Description, and the System Integrity Plan, including an outline of the Operational Reliability Assessment of the pipeline. A graphical depiction of the LMP are the 184 annotated alignment sheets that comprise Volume 3 of this EA. These sheets illustrate mitigation measures to be implemented at particular locations.

9.2.5.1 LMP Project Description

The Project Description section contains a brief description of the System, including a listing of the major subsystems. An overview of the project and a description of the planned operation are also provided in this section of the LMP. A more comprehensive description of the System and its operation is provided in Chapter 3 of this Environmental Assessment.

9.2.5.2 LMP Longhorn Pipeline System Integrity Plan

The major section of this LMP is the Longhorn Pipeline System Integrity Plan (LPSIP). The LPSIP is the core organizational driver for Longhorn management initiatives and operational priorities. It is charged with making improvements based on system integrity analyses and performance metrics. The LPSIP also has the responsibility for resource allocation (time, talent, and money) targeted at risk mitigation.

The LPSIP consists of certain specific "Process Elements," which, together with the LMC, reflect Longhorn's commitments in the areas of human health and safety and the environment. These process elements include:

- Corrosion Management Plan;
- In-Line Inspection and Rehabilitation Program;
- Identification and Assessment of Key Risk Areas;
- Damage Prevention Program;
- Encroachment Procedures;
- Accident Investigation Program;
- Management of Change;
- Depth of Cover Program;
- Fatigue Analysis and Monitoring Program;
- Scenario Based Risk Mitigation Analysis;
- Incorrect Operations Mitigation; and

- System Integrity Plan Scorecarding and Performance Metrics Plan.

Detailed descriptions of each of these process elements, and the manner in which they are incorporated into the mitigation measures, are included in the LMP. The integrity of the Longhorn pipeline and the implementation of LPSIP will be monitored by Longhorn and DOT and remedial action will be made as necessary as determined, in part, by the Operational Reliability Assessment (ORA).

9.2.5.3 LMP Annotated Alignment Sheets in Volume 3

The annotated alignment sheets found in Volume 3 show, by graphical means, the various mitigation measures that are applied at each point on the pipeline. The alignment sheets are arranged from MP 0.0 at GATX Station east of Houston to MP 694 at the El Paso Terminal. Each alignment sheet is a strip of aerial photography of the pipeline route, with the location of the pipeline superimposed on the photographs. Significant features, such as waterways, population centers, and county lines are also labeled in the photographs.

The targeted Index Sum Scores and the Index Sum Scores before and after mitigation are plotted right below the alignment sheet so they can be related to any point on the alignment sheets. The Tier designations for each segment of pipeline are noted on the alignment sheets. For example, if someone were interested in a particular stream crossing, or segment of pipeline passing through their property, he or she could see at a glance the "before" and "after" mitigation levels and any site-specific mitigation measures Longhorn is committing to on this segment. In summary, the annotated alignment sheets provide a complete visual representation of the LMP and its application at every point along the pipeline.

This can best be understood by looking at one of the 184 sheets in Volume 3. The process can be followed by any segment. Sheet number 76, for example, addresses the mitigation measures to be applied over a portion of southwest Travis County in the most sensitive stretch of the route along the entire System.

Sheet No. 76 begins at MP 168.29 and ends at MP 171.02 for a distance of slightly less than 3 miles. Most of the 184 sheets in Volume 3 are predominately or entirely composed of Tier I areas. This segment of pipeline is composed entirely of sensitive and hypersensitive area.

The Longhorn pipeline is the dark solid line that runs through the center across the photographic portion of the alignment sheet in the top third of the page. Along the pipeline are printed designations of various tiers. At the far right end of Sheet No. 76 is a Tier III area to the

east of the large expressway (I-35). The short Tier III area is a stream crossing. To the west of Interstate 35 the pipeline lies in a Tier II area until the middle of the page where there is another Tier III area (ground water sensitive). Continuing west, through a Tier II area, is the beginning of a long Tier III area where the pipeline crosses the recharge zone of the Edwards Aquifer BFZ. This Tier III area continues on the next alignment sheet, No. 77.

The middle third of the alignment sheet contains a graphic with three horizontal lines that generally match up with the pipeline in the photo. The lower line, a series of short dashes, shows the pre-mitigation condition of the pipeline as determined by the EA Risk Model. At this point along the pipeline, the Index Sum level is generally at or below 200 points. The middle horizontal line, with a pattern of two short dashes followed by a long dash, is the EA Risk Model score target level for each tier. Where the pipeline crosses sensitive areas, the target level line is at 240; where it crosses hypersensitive areas, the target level increases to 280. If there were a Tier I, or non-sensitive area on this sheet, the target level line would be 200.

The uppermost, dark solid line is the EA Risk Model Score after mitigation. This sheet shows that post-mitigation index sum scores are well above the target levels for most of the line. At a glance, one can tell that Longhorn's mitigation measures resulted in scores that comply with the Lead Agencies' target levels. For the portion of the pipeline that crosses the Edwards Aquifer recharge zone, Longhorn's risk scores (higher than 330) are well above the required Tier III target level of 280. This "overcompliance" reflects the LMP response to the multiple factors that create hypersensitivity in this area.

The bottom portion of the sheet contains three boxes. The box on the left lists the generic mitigation measures that will occur in all Tier II sensitive areas, while the box in the middle lists the same for the Tier III areas. (If there were any Tier I areas there would be a box to address these areas as well.) An example of a generic measure is an accident response time of less than two hours. These generic measures apply to all pipeline segments in Tier I, II, and III areas, respectively.

The rightmost box contains a list of measures that are not included among the generic measures but are unique for this sheet. Note that there are five such measures in Sheet 76. These are: 1, 2, 3, 4, and 12. These numbers are shown on the pipeline and listed in the box. for example, in the middle of the sheet is the number 4 and a short stretch of pipe that is depicted in a heavier line. The number 4 indicates that the pipeline is being lowered, replaced, or reconditioned before project start-up. LMC 30 in the LMP provides more details on this measure.

On the left side of the sheet, where the Tier III area crossing the Edwards Aquifer recharge zone begins, the line becomes heavy and there are four numbers: 1, 2, 3, and 12. Item 1 in the rightmost box indicates this measure is the installation of new pipe. (By reading LMC 3, one can learn that this pipe is heavy walled as well.) Item 2 indicates that Longhorn will install a sensor-based leak detection system over this segment as well. This will be installed before startup and operating within six months of startup. Item 3 indicates that there will be daily patrols over this area. Finally, Item 12 indicates that this area is part of the Water Supply Contingency Planning described further in LMC 30.

In summary, these 184 annotated alignment sheets in Volume 3 of this EA allow one to determine whether the segment of interest is in a non-sensitive, sensitive, or hypersensitive area. Next, the annotated alignment sheets will demonstrate how Longhorn has met the target risk level for each tier. Finally, the sheets will show what generic and specific mitigation measures are being applied to the pipeline.

9.2.5.4 Avoiding Significant Effects through Mitigation

Federal regulations governing the preparation of NEPA documents do not set out objective and explicit guidelines as to what constitutes a threshold separating impact "significance" and "insignificance." There are no quantitative limits, such as acceptable risk levels or acceptable concentrations of discharges. The regulations (40 CFR §1508.27) do identify considerations that Lead Agencies take into account in making this judgment call. These include qualitative factors, such as the "degree to which the action affects public health or safety," the degree to which the action may affect historic, cultural, or scientific resources, or "whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment."

The Lead Agencies have determined that the Proposed Project, as originally planned, poses the potential for significant impacts. The mitigation measures, to which Longhorn has committed, reduce the potential impacts to a level of insignificance through their collective effect. The collective effect can be seen through looking at Tables 9-2 and 9-3.

Table 9-2 lists each of the 34 separate mitigation measures (or Longhorn Mitigation Commitments) and generally describes the natural resources or sensitive receptors that each measure would protect and how each measure would reduce risks. The table also explains how the measures address different failure modes (outside-force or third party damage, corrosion, material defects, operator error).

Table 9-3 shows how individual measures listed in Volume 3 for Tier I, II, and III areas address several categories of impacts typically addressed under NEPA. The table shows at a glance that most measures address several impact categories simultaneously and that each impact category is addressed by multiple measures. In other words, the mitigation provides a "criss-crossing" redundancy so that any potentially significant impact requires multiple "lines of defense."

How this multi-layered array of mitigation works to protect the Barton Springs Salamander, for example, is described below. The potential threat is that a major spill from the pipeline across the recharge zone of the Edwards Aquifer would quickly find its way through the recharge zone to the aquifer and then into Barton Creek resulting in contamination of the aquatic habitat of this threatened and endangered species. Referring again to Sheet 76 where the three-mile crossing of the recharge zone begins, the multiple layers of protection from such a spill are as follows:

- LMC 1 will demonstrate that the pipeline is capable of withstanding 125 percent of the pipeline's maximum operating pressure (MOP) through hydrotesting before System startup.
- Nevertheless, LMC 34 states that Longhorn will not allow maximum allowable surge pressures (allowed by regulations to be 110 percent of MOP) to exceed MOP over all sensitive and hypersensitive areas.
- Over this three-mile stretch of hypersensitive area, Longhorn will install new, heavy-walled pipe (LMC 3). Collectively, the new pipe, its thicker walls, the testing before start up and commitment to avoid conditions that could result in surges above MOP, sharply reduce the probability of leaks or spills. Additional measures to further reduce the probability of spills are described below.
- In addition to hydrotesting, the Valve J1-to-Crane segment of the pipeline will be subject to in-line inspection to identify, and repair as necessary, cracks and other anomalies found through internal investigation of the pipe (LMC 10-12). This will occur within three months of start up.
- To reduce the likelihood of third party damage to the pipeline, Longhorn will conduct enhanced public education/damage prevention programs (LMC 25).
- Longhorn will also increase the frequency of cathodic protection surveys to reduce likelihood of corrosion (LMC 32).
- While most pipelines have weekly surveillance, Longhorn has committed to a patrol frequency of once every 2.5 days (LMC 20) for sensitive and hypersensitive areas. However, in this three-mile crossing of the recharge zone, Longhorn will have daily patrols.
- To allow these daily patrols to more readily spot signs of leakage, Longhorn will maintain the ROW to excellent condition across the entire line (LMC 17).

- In the unlikely event of small leaks that would escape notice of other techniques over this three-mile recharge zone, Longhorn will install a state-of-the-art sensor-based leak detection system before start up with full implementation within six months of start up.
- Longhorn has committed to being able to shut down the System within 5 minutes of detecting a leak of one barrel per hour in this 3-mile section (LMC 13).
- Once a leak has been discovered, Longhorn will implement measures to enable a response to a spill in less than 2 hours.
- Finally, in a measure (LMC 28) specific to the preservation of the Salamander, Longhorn will revise its Facility Response Plan, if necessary, to make it consistent with the City of Austin's Barton Springs oil spill contingency plan and the US Fish & Wildlife Services Barton Springs Salamander Recovery Plan. In separate measure, LMC 33, Longhorn will provide funding for a refuge and captive breeding program that would replace individual Salamanders that could be loss in the unlikely event of a toxic level of product released to Barton Springs.
- Although not listed as a separate measure, Longhorn has isolated a nine-mile portion of the line, including these three miles, through remote controlled valves that would automatically shut off and limit the quantity of product that would be loss to the environment should a leak occur. Additional sets of such valves could be constructed on either side of other hypersensitive crossings through implementation of LMC 22, a series of studies that could lead to DOT requiring more valve construction.

This portion of the pipeline is the most sensitive along the entire route and therefore requires an extraordinary combination of measures to reduce the impacts to a level of insignificance. They illustrate the principle, found in varying degrees across the entire System, of implementing various means of reducing the probability of failure, increasing the detection of leaks and spills, and increasing the capability to respond to leaks when they do occur.

9.2.5.5 Comparison of the Before and After Mitigation Condition of the Pipeline

Figures 9.1 and 9.2 illustrate with color codes how mitigation measures reduce the impacts on pipeline segments based on the EA Risk Model Index Sum scores. The annotated alignment sheets show the before and after scores for site-specific segments along the pipeline.

Table 9-4 shows the before and after scores for specific pipeline segments and for the entire pipeline. The top row of figures shows that, before mitigation, the average score for the entire pipeline was 195 and, following mitigation, the average would increase to 279. This top row also indicates that the minimum score for the entire pipeline was 139 before mitigation. After mitigation, the lowest score would be 237. This is well above the Tier I target level of 200

and near the Tier II level of 240. Table 9-4 also shows minimum, average, and maximum scores for various tier levels in the two large urban counties: Harris and Travis. The table indicates that the hypersensitive areas in Harris County (mostly due to population density) were exposed to pipe segments with minimum scores of 164 prior to mitigation. Following mitigation, the minimum score in Harris County sensitive areas would be 284, while the average score would be 295. The table also illustrates a major improvement in the risk scores for Travis County, where the minimum score in hypersensitive areas before mitigation is 168. Following mitigation, the lowest score in a Travis County hypersensitive area would be 284.

Figures 9-5 and 9-6 depict these same data (minimums and averages, but not maximums) in bar charts.

9.3 CONCLUSIONS

The Lead Agencies have prepared this expanded EA to evaluate the impacts of the proposed project and its alternatives on the existing environment. On the basis of the available information, including information provided by Longhorn, along with comments presented by the plaintiffs and other interested parties, the Lead Agencies have made a preliminary finding that the human and natural environments will not be significantly impacted by the proposed pipeline project, provided it is accompanied by the mitigation measures detailed in the EA.

9.3.1 Construction

Most of the remaining construction will occur in relatively non-sensitive areas, some of which have been previously disturbed, e.g., the Fort Bliss pipeline corridor. Replacement of pipeline in the Barton Springs recharge zone for mitigation purposes will occur in a hypersensitive area, but only within the previously disturbed ROW of the existing pipeline. Since the specific locations are not presently known, a supplemental EA will be required prior to construction of the additional pump stations needed to incrementally increase the delivery capacity of the pipeline. The construction may also require consultation under the National Historic Preservation Act and Endangered Species Act, and the imposition of additional air quality controls on the El Paso Terminal.

9.3.2 Operation

Ordinary operation of the pipeline will not significantly affect environmental quality because it will entail no significant routine emissions of air contaminants or discharges of pollutants. Nor will it significantly increase ambient noise levels. ROW maintenance activities

in areas where threatened or endangered species may be present will be scheduled and conducted to avoid potential harm.

9.3.3 Potential Risks

Potential risks posed by the proposed project are primarily associated with the possibility of a serious accident resulting in a spill. Determining whether such risks are significant requires consideration of two elements (1) probability of occurrence and (2) consequences or the degree of harm which could result from an occurrence. The Lead Agencies employed a process designed to identify and reduce both the risk of spills and their potential consequences, and tentatively conclude that the combination of mitigation measures developed through that process will adequately mitigate the risks posed by serious accidents.

A mathematical model based on known causes of pipeline failure was developed to evaluate the probability of a spill due to pipeline failure at each segment along the pipeline. Three levels were established as targets with the goal of providing ample protection for the entire length of the pipeline, but also with the goal of providing greater protection in more sensitive areas. Progressively higher model target levels were set in areas with higher sensitivities to assure the probability of accidents would be lowest in areas where the human and natural environment is most vulnerable. Generally, the area traversed by the old Exxon pipeline contained the areas of greatest relative sensitivity and vulnerability, rendering the potential consequences of a spill more severe in portions of that area, e.g., the Barton Springs recharge zone.

9.3.4 Mitigation

The Lead Agencies requested that Longhorn develop a mitigation plan, based on guidance from the Lead Agencies, which would address the specific causes contributing to the risk of spills in each pipeline segment and the consequences of spills. Longhorn developed and submitted a mitigation plan that exceeded the Lead Agencies' risk goals in every area. In addition to decreasing the risk of spills, the mitigation plan includes measures which will limit spill consequences, rendering their effects temporary and localized.

Longhorn will increase the frequency of patrols in sensitive and hypersensitive and the Edwards Aquifer areas. In addition to improved leak detection, a benefit of the increased frequency of patrolling will be the improved detection of third party activity in the pipeline ROW. Further, the system is designed to shut down within five minutes of a leak indication, with enhanced detection capabilities over the Edwards Aquifer recharge zone. The primary

benefit of this system is reduced times between detection and shutdown that would limit the quantity of product released to the environment. Longhorn will also prepare a contingency plan to provide alternate water supplies to municipalities with sensitive water resources along the pipeline ROW. The cumulative effect of these mitigation measures, including those listed above, substantially reduces the likelihood that large spills would occur and are fully described in Table 9.2.

9.3.5 Potential Impacts

It is the preliminary finding of the Lead Agencies that the combination of proposed mitigation measures when implemented reduces the potential impacts of the Proposed Project to an insignificant level. The assessment process utilized in this matter has eliminated the potentially significant effects of the pipeline project and will avoid the potentially significant effects of the "no-action" alternative which would return the old Exxon pipeline to crude oil transport. Resumption of crude oil transport between Houston and Crane could result in less overall protection to the human and natural environment because DOT could not require implementation of the specified mitigation measures, which exceed the requirements of substantive law.

Also, transportation of the refined products from the Texas Gulf Coast to the El Paso Gateway Market by large tanker trucks would introduce higher risks than those of pipelines, as discussed in Chapter 6. In particular, the number of deaths from tanker truck fires and explosions is more than 80 times greater than the number of deaths from pipeline accidents based on an equivalent number of gallon-miles shipped. Although the probabilities of tanker truck spills are higher than for pipelines, the quantity of product released to the environment is limited to the 8,500-gallon capacity of the tanker trucks.

The proposed action is compatible with the existing land uses in the area. The proposed pipeline shares the right-of-way with several other pipelines and would not result in a major change in land use, nor would its addition elevate adverse conditions to a level that is significant. If Longhorn operates the pipeline in accordance with its mitigation plan, the enhanced surveillance of its own pipeline will also enable detection of leaks from other pipelines in the rights-of-way and enable quicker response times and reduction of potential risks to the environment.

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